

# SAVING FRESHWATER FISHES AND HABITATS

Newsletter of the IUCN SSC/WI Freshwater Fish Specialist Group

Issue 4 • March 2014

## ISSUE:

- FFSG welcomes new Global Chair
- NEW Global Freshwater Fish BioBlitz
- Introducing FFSG South America region
- In search of the Mangarahara cichlid
- Killifishes on the edge
- And more.....



**Wetlands**  
INTERNATIONAL

# CONTENTS



## FFSG UPDATE

- 3 Message from the FFSG Global Chair
- 4 Welcome to the new Global Chair, Dr Richard Sneider  
*by Katalin Csátádi*
- 5 Changes to the FFSG Secretariat
- 6 Professor Gordon McGregor Reid awarded the IUCN SSC Chair's Citation of Excellence  
*by Suzanne Turnock*
- 7 New Global Freshwater Fish BioBlitz to Monitor Fish Species with Help of 'Citizen Scientists'  
*by Suzanne Turnock*
- 9 Introducing FFSG Regions: South America  
*by Roberto E. Reis*

## NEWS FROM AROUND THE WORLD

- 14 IUCN Red List assessments of freshwater fishes of the Tropical Andes  
*by Marcelo Tognelli and Neil Cox*
- 15 Brazilian Action Plans for freshwater fishes  
*by Carla Polaz*
- 16 U.K.'s rarest freshwater fish 'reappears'  
*by Ian J. Winfield and Andrew R.D. Gowans*
- 17 In search of the Mangarahara cichlid  
*by Brian Zimmerman*
- 23 A community-led fish sanctuary initiative on Hainan Island, China  
*by Bosco P.L. Chan*
- 26 Killifishes on the edge  
*by Jörg Freyhof*
- 26 What to do if there is no more water? Conservation of *Aphanius sirhani*, the Azraq Killifish  
*by Nashat Hamidan*
- 28 Tilting at windmills: Conservation of *Valencia hispanica*  
*by Matt Ford*
- 29 A Critically Endangered freshwater fish species of North Africa likely to be extinct in the wild  
*by Mahmoud Bacha, Chabane Benamirouche and Jörg Freyhof*
- 30 *Aphanius farsicus* might be extinct in the wild  
*by Hamid Reza Esmaeili and Jörg Freyhof*
- 30 Conservation action for the Aci Göl toothcarp, *Aphanius transgrediens*  
*by Baran Yoğurtçoğlu and Güler Ekmekci*
- 32 Southern African tigerfish population learns to actively predate on swallows on the wing  
*by Gordon O'Brien, Francois Jacobs, Steven Evans and Nico Smit*

## OPINION

- 34 Tackling giants: getting the most out of working groups for freshwater fish conservation  
*by Harmony Patricio and Steph Januchowski-Hartley*

## NOTICEBOARD

- 36 Upcoming events and conferences

## 2 CONTENTS

**Editor-in-chief**  
Ian Harrison

**Editor**  
Katalin Csátádi and  
Suzanne Turnock

**Design**  
Katalin Csátádi and  
Suzanne Turnock

**Front cover image:**  
Roberto Reis (FFSG  
Regional Chair for South  
America) castnetting in  
Purus River, Peru  
Photo: James Albert

## Message from the FFSG Global Chair

### Dr Richard Sneider



This year we celebrate the 50th anniversary of IUCN's Red List of Threatened Species. IUCN is like the UN and many other major international organisations that attempt to address global issues across cultures, regional interests and history, specific environmental and political circumstances, religions, views on the meaning of life, and so forth, faces the daunting tasks of building a dialogue in the Tower of Babel. Precisely because the overall vision of these organisations is so daunting, we invariably find that we are unable to fulfil all the required tasks, and so the organisations often fall short of expectations and we find ourselves disappointed. However, even under these shadows, the accomplishments that do get done are of such universal consequence that we ought to recognize that these outweigh the despair of what hasn't been accomplished, and is yet to be accomplished.

In a conversation with the film director Werner Herzog, I asked him what he deemed some of his most significant contributions at large to be. One would have expected of him to talk about his widely known and acclaimed films Fitzcarraldo, Aguirre, Nosferatu, and so forth, but no, he spoke about a documentary he just made about texting and driving. In it, Werner interviewed and portrayed a story of a young couple who were having fun texting while driving across the middle USA, in what seemed empty roads; in a moment of distraction the young man got into an accident, which killed many members of a family. Needless to say, the horror of the story destroyed not only those killed, but the young couple's lives as well. Herzog, after a quiet moment during the dialogue, told me that if his piece could prevent even one of these accidents from happening, that! in itself, made all his work meaningful!

Herzog's story made me realize even more so, that contextual, small prevention of destruction and pain, at times even single instances, can be transcendental. At a luncheon with Cristiana Figueres she expressed to me that her greatest frustration in running the climate change initiative of the UN was the seemingly futile attempt to make a significant impact of such global/universal proportions, and that often, in face of such futility, people

abandon all hope and thus do nothing! Well, IUCN indeed faces the futility of saving all species and their environments, but must celebrate the accomplishments it has made and continues to make, every day, in saving so many species, and their environments, and thus, life in its many manifestations. It is a privilege to be part of this organization and group of people, and an honour to chair the FFSG. Let us celebrate the great accomplishment made by IUCN, the IUCN Red List, and continue supporting and enjoying all, its daunting task, and its small, and large scale victories as well!

A handwritten signature in black ink, appearing to read 'Richard Sneider'.

Richard Sneider  
FFSG Global Chair



The IUCN Red List of Threatened Species is celebrating 50 years of guiding conservation action. [Learn more](#)

# Welcome to the new Global Chair, Dr Richard Sneider

## Katalin Csatádi

FFSG Programme Officer

---

We always knew that the day would come when Gordon really resigns (he had been threatening us for quite a while), but no one really knew what would happen once he stepped down. And then in the beginning of last year, when he turned 65 he did mean it, so we took a deep breath and plunged ourselves into the process of the impossible..... finding Gordon's successor.

A committee, chaired by South Africa's Professor Paul Skelton was put in place and the call went out for nominations. FFSG members responded well to the announcement and sent us the names of various, excellent ichthyologists, conservationists and other professionals. They were asked to declare whether they accepted the nomination and if so, then to prepare a written statement of why they would like to chair the FFSG and to describe their idea of the group's future.

Amongst the nominations was a person who was new to many of us in the Group. But when his piece on his views of the FFSG's

future arrived, we knew that Dr Richard Sneider could capably fill Gordon's large shoes. Richard explained how he intended to lead the FFSG to thrive in the years to come. He explained how he'd look at how to continue the ongoing programmes and start new ones. His discussion was full of knowledge, interest and passion.

Richard has decades of leadership experience behind him as CEO of One World Apparel LLC and Unger Fabrik LLC. He is multicultural, being born in Mexico, living in the USA, travelling around the world. He serves on the board of Conservation International and Los Angeles Zoo; he regularly participates in freshwater fish field surveys; he designs, builds, and maintains several diverse freshwater ecosystems in his impressive home aquariums and terrariums. I'm sure that everyone will agree that the FFSG has found the leader it needs, and that it is facing great years ahead.

*Welcome to the FFSG, Richard!*



Richard in his home aquarium

# Changes to the FFSG Secretariat

---



**Dr Ian Harrison has joined the FFSG Secretariat** to assist the new Global Chair, Richard Sneider, in the role of Technical Officer. Ian has already been a very important member of FFSG; he has acted as a Steering Committee member and as Special Advisor for Fundraising.

Ian obtained his Ph.D. in systematic ichthyology at the University of Bristol (UK) has conducted postdoctoral research on marine and freshwater fishes in universities and museums in France, Italy, Belgium and the USA. He has conducted fieldwork in Europe, Central and South America, West and Western Central Africa, the Philippines and the Central Pacific.

He has assisted IUCN's Global Species Programme, coordinating activities for the Global Freshwater Biodiversity Assessment, a joint programme run by IUCN, Conservation International (CI) and NatureServe. He is currently working for CI's Centre for Environment and Peace on their freshwater programmes, and works with the University of Minnesota on an international collaborative project, funded by the Belmont Forum.

**Dr Katalin Csatádi is leaving the FFSG** after serving as Programme Officer since early 2012, with a hiatus in 2013 when she was on maternity leave. Kati returned to the Group at the end of 2013, but will be leaving us so she can really give her full time to her baby daughter, Ella.

All of us in the FFSG are extremely grateful to the friendship and support that Kati gave us in the last two years, especially through the busy time of the IUCN SSC Chairs' Meeting of 2012. We wish her and her family the very best for the future.



**Dr Fareed Krupp has resigned from his position as Chair of the FFSG Southwest Asia region** due to his very large work commitments in the region and, especially, organizing the next Session of the World Heritage Committee in Doha, Qatar.

We thank Fareed for his important contributions to the FFSG and welcome his contribution as an ordinary member (without the extra commitments of a Regional Chair) for the near future.

# Professor Gordon McGregor Reid awarded the IUCN SSC Chair's Citation of Excellence

**Suzanne Turnock**

FFSG Programme Officer

In February 2014, Gordon McGregor Reid received the SSC Chair's Citation of Excellence in recognition for his exemplary, visionary and charismatic leadership of the Freshwater Fish Specialist Group, between 2004 and 2013. The Citation of Excellence, created in 2004, is awarded in recognition of outstanding contributions to the SSC. The award was presented to Gordon, by Simon Stuart (SSC Chair), at the North of England Zoological Society (Chester Zoo). Gordon thought he was invited to the zoo for a farewell lunch - it was a complete surprise and he had no idea he was going to be honoured. In response to receiving this distinguished award, Gordon has shared the following words:

"In gaining the IUCN SSC Chair's Citation of Excellence, I hugely appreciate the immense compliment paid to me personally and also to the North of England Zoological Society (Chester Zoo), its Trustees and staff. No one achieves such prestigious awards on their own. The Zoo has been working in close partnership with the IUCN (formerly the World Conservation Union, of which we are a member) for more than 30 years now. We see the IUCN Species Survival Commission as a leading body and 'guiding light' for global species conservation. We have, over the years, worked with many SSC Specialist Groups, notably: the Conservation Breeding SG, Reintroduction SG, Asian Elephant SG, Amphibian Ark (IUCN CBSG in partnership with WAZA) and, of course, the Freshwater Fish SG.

I have been very involved with all of these foregoing groups; but most closely with the FFSG, where I recently stepped down as Global Chair after nearly a decade of voluntary service. In about 2001, I was approached by Dr Will Darwall, Head of the IUCN Freshwater Biodiversity Unit about bringing the (then defunct) FFSG under my chairmanship. They wanted me to develop it as a partnership between the IUCN SSC and Wetlands International. I was pleased to take on this large task because my early training was in fish, fisheries and freshwater biology at the University of Glasgow, at the British Museum of Natural History; and in the wild in Africa and elsewhere overseas.

By 2004, the FFSG moved from being an informal collective of conservation enthusiasts to a fully reconstituted body, officially recognized and co-governed by the SSC and Wetlands International. FFSG fish conservation conferences for 'fish heads' have been organized on a biennial basis, to date; as



**Gordon receiving the award from Simon Stuart, Chair of the IUCN Species Survival Commission**

well as IUCN Red List training workshops at home and abroad to accurately determine the threat status of thousands of fish species. To assist in the large and growing task of the day-to-day management of the FFSG, the Trustees of the Zoo kindly agreed to me appointing a part-time Programme Officer: first Claudine Gibson; later Katalin Csatádi; and, most recently, Suzanne Turnock who is still in this role. I could not have done without this truly excellent and dedicated support, and that of many other Zoo staff and FFSG members, including Rachel Roberts of IUCN SSC headquarters.

As can be seen from checking out the [FFSG website](#), we have grown to a substantial organization with a global remit in the conservation of freshwater fish and their habitats. We now have over 150 Members and 18 Regional Chairs around the world. There are many active and diverse FFSG programmes, projects and partnerships in support of conservation off-site and in the wild. Some examples of high profile activities in conjunction with Chester Zoo are, e.g. Mexican Fish Ark, Global Freshwater Fish Bioblitz, World Fish Migration Day .... I have now handed over to the new FFSG Chair, Dr Richard Sneider, and his Technical Officer, Dr Ian Harrison. I am very happy to see that the organization is in safe hands. I wish all my friends and colleagues in the FFSG all good fortune in continuing to conserve fishes and habitats; and I intend to remain active myself, but in a far more modest capacity!"

# New Global Freshwater Fish BioBlitz to Monitor Fish Species with Help of ‘Citizen Scientists’

**Suzanne Turnock**

FFSG Programme Officer

The ‘Global Freshwater Fish BioBlitz’ kicked off on World Wetlands Day 2014 (2<sup>nd</sup> February) to engage nature lovers in freshwater fish conservation. The FFSG has joined forces with other international groups, namely World Wildlife Fund, Conservation International, IUCN, Wetlands International, FishBase, the Fisheries Society of the British Isles and the Group on Earth Observations Biodiversity Observation Network, to introduce this new global initiative. The BioBlitz project, designed by iNaturalist.org, will be hosted on the FFSG website [www.iucnffsg.org/bioblitz](http://www.iucnffsg.org/bioblitz).

People from around the world, whether they are anglers, photographers, students or nature lovers, are invited to upload photographs of freshwater fishes observed in their natural habitat, with details of where and when they saw the fish. Volunteers with expertise in fish taxonomy will serve as curators to identify and verify the species to ensure the data are research-grade. The information can assist scientists to describe new species, help assess the risk of extinction for the IUCN Red List of Threatened Species, track the spread of invasive species, and be exported to freely accessible online data archives, such as Encyclopaedia of Life.

The launch of the project also highlights the importance of freshwater fishes for the protection of internationally important habitats. “More than three-quarters of Ramsar’s Wetlands of



**Amatola barb (*Barbus amatolicus*). Photo: Craig Garrow**



## Global Freshwater Fish BioBlitz

International Importance, or Ramsar Sites, are entirely or partly freshwater sites, and, of those, over 30 percent became Ramsar Sites because of their important fish species” said Christopher Briggs, Secretary General of the Ramsar Convention on Wetlands. “The more data we have on the species present in our wetlands, the better we can manage them. The Freshwater Fish BioBlitz will provide a wealth of essential information for managing our wetlands and their fish species.”

Projects like this are needed as Will Turner, Senior Vice President for the Moore Center for Science and Oceans at Conservation International, explains “Freshwater fishes may be the most endangered group of vertebrates, with a third of all species threatened with extinction due to overfishing, pollution, habitat loss and fragmentation, alien invasive species and climate change.”

“The BioBlitz is our way of bringing the power of crowdsourcing to freshwater fish conservation,” said Michele Thieme, Senior Freshwater Conservation Scientist at World Wildlife Fund. “Wildlife monitoring is vital to conservation, since we can’t protect species unless we know where they live and what threats they might be facing. Engaging the public all over the world will help us identify more species in more places than we possibly could alone.”

“It is a huge task – with over 15,000 freshwater fish species, and numbers continually growing,” said Dr Richard Sneider, Global Chair for the FFSG. “More than 300 new fish species are described every year on average, so the more people ‘on the ground’ carrying out observations and recording what they have seen, the better.”

The Global Freshwater Fish Bioblitz is inspired by another Bioblitz for amphibians, which the Amphibian Specialist Group began more than two years ago. “We’re hoping to mimic the success of the Global Amphibian BioBlitz, which has been embraced by citizen-scientists throughout the world,” said Sneider. “In only two years they’ve recorded more than 1,500 taxa and even discovered a new species. I’d say that’s a pretty good start.”

If this project is of interest to you, there are a number of ways you can get involved:

#### **Volunteer as a ‘Curator’**

We are still looking for more volunteer ‘Curators’, to identify and verify species submitted by members of the public. So far we have 40 expert volunteers, but are recruiting more, to ensure we have a cross section of expertise and the commitment is not too time consuming for individuals. Volunteers need to have expertise in fish taxonomy, expert knowledge of a taxonomic group or fishes found in a particular geographic region and be willing to commit time to verify species identifications. With the Global Amphibian BioBlitz, many specialists have benefited from observations in their area of interest. For example, an individual could subscribe

to receive an email summary of all reports of threatened cichlids from Bolivia. These highlights can lead to important research collaborations. It is also important to note that observations can be identified to coarser taxonomic levels, such as genus or family, which is often the case for observations of cryptic species or poor quality photographs.

#### **Publicity**

We are looking for opportunities to promote this project to members of the public and encourage them to upload their observations. If you can help spread the word about the Global Freshwater Fish BioBlitz (e.g. through social media, membership networks, websites etc.), I would love to hear from you!

#### **Upload observations**

To make this project a success and be a valuable tool for freshwater fish conservation, we need people to submit their observations! Instructions on how to upload observations are available to ensure it is made easy for everyone.

If you would like to be involved in the Global Freshwater Fish BioBlitz or for more information, please email [info@iucnffsg.org](mailto:info@iucnffsg.org)





# Introducing FFSG Regions: South America

**Roberto E. Reis**

FFSG Chair for South America



**Black water tributary  
to Rio Tocantins, Brazil.  
Photo: Roberto Reis**

South America is an island continent. It has been evolving, both geologically and biologically, isolated from the remaining parts of the World since the final breakup of the Gondwana in the Cretaceous. This giant island stretches for approximately 7,500km in its north-south axis, and more than 5,000km from east to west, separating the South Atlantic from the South Pacific Oceans. It has 17.84 million square kilometres and a human population exceeding 387 million inhabitants.

Countries in South America are Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. South American geology is dominated by three main land masses that determine many of its landscape features: the Precambrian Guiana and Brazilian Shields, and the much newer Andean Mountains – the largest mountain ridge in the World. Spread between these three higher land masses lies a gigantic, flat depositional lowland, that contains the largest rainforest of the World; the Amazon forest. Water chemistry of South American rivers is influenced by these landscape features and vegetation cover. Those rivers draining the Andes are sediment-rich white-water rivers, like the

Amazon, Marañon, Solimões, and Madeira. Rivers that originate in the thickly forested lowlands, like the Negro, Japurá, or Tefé, are black-water Rivers. They are tannin-rich, dark-tea-coloured and have very low sediment loads. Finally, rivers that drain the ancient and well-weathered crystalline rocks of the Guiana and Brazilian Shields are clear-water Rivers, with low sediment and high transparency, like the Xingu, Tapajós, and Ventuari.

The geological complexity of South America created a wide range of aquatic habitat types, including many of the largest rivers of the world, extensive marshes, high-altitude lakes and rivers, among other settings. Approximately 25–28% of all free, surface fresh water of the world is in South America. Five South American rivers are among the ten rivers with highest water discharge – Amazon, Orinoco, Madeira, Negro and Parana; together discharging over 390,000m<sup>3</sup>/s into the Atlantic Ocean. The Amazon River alone is by far the largest in the world, with 219,000m<sup>3</sup>/s. Perhaps more impressive than the Amazon discharge are its 250,000 square kilometres of seasonally flooded lowlands, that harbour an enormous diversity of specialized fishes.

South America also has extensive marshes and permanently flooded wetlands, the most remarkable being the Llanos of the Orinoco River in Venezuela, with about 300,000 square kilometres, and the Pantanal of the Paraguay River with around 160,000 square kilometres, that stretches between Brazil, Bolivia, and Paraguay. Other remarkable aquatic habitats are the Andean Altitudinal Rivers and lakes, which have a fish fauna highly specialized for life in fast-flowing, well-oxygenated, cold waters, and the endorheic river basins of the southern cone of the continent, which harbour very poor fish fauna.

### Fishes of South America

The freshwater fish fauna of South America is the most diverse of all continents, with the current number of described species surpassing 4,000, and estimates of final numbers around 6,000. Besides being mega diverse, the Neotropical freshwater fish fauna is ancient and has diverse historical origins. The marine ancestors of most of the smaller groups independently invaded and diversified in fresh waters of South America during the Palaeogene, primarily the Oligocene and Miocene. The main groups, such as the Cichlidae and the Ostariophysi, however, have been isolated on the continent since the end of the Gondwana break-up in the Cretaceous, roughly 100 million years ago.

South American fishes are usually classified in three divisions according to their origin and distribution on the continent. The Peripheral Division includes almost 300 species in 28 chiefly marine families, which have invaded and specialized for life in fresh waters. These groups range from one to around 100 species, and include freshwater stingrays, eels, sardines, anchovies, mullets, needlefishes, silversides, pipefishes, drums, gobies, flatfish and puffers, among others. The Secondary Division has above 600 species, and is composed of freshwater families that are closely related to marine groups, but are entirely confined to continental

habitats, and include the cichlids, the highly threatened rivulids, anablepids, cyprinodontids, and poeciliids. In contrast, the Primary Division is composed of the Ostariophysii and four other small families that originated and diversified in freshwater habitats: the South American lungfish (Lepidosirenidae), the pirarucu, the largest freshwater South American fish (Arapaimidae), the two species of arowanas (Osteoglossidae) and half a dozen of leaf-fishes (Polycentridae). The Ostariophysii, with over 3,000 species in South America, comprises about 75% of all freshwater fishes worldwide. In this group are the tetras, piranhas, trahiras, and their allies or Characiformes, the electric eels and other knifefishes or Gymnotiformes, and the catfishes or Siluriformes.

Diversity of morphological adaptations and ecological requirements are also dramatic across the South American fish fauna. The armoured catfishes or Loricariidae, the largest catfish family with above 800 species, includes remarkable examples. Some species live in highly oxygenated, fast-flowing Mountain streams while others dwell in almost anoxic lagoons in Amazonian lowlands and use their intestines as an accessory respiratory organ. Other amazing adaptations can be found among catfishes, such as the phreatic habits of *Phreatobius*,



*Hypostomus luteus* from Rio Uruguay Photo: José Pezzi

a genus of a few species that live inside the soil in river banks and are most easily captured in existing water wells.

Possibly the strangest feeding habits among South American fishes are those of the blood-sucking, parasitic candirus of the genus *Vandellia*. These fishes are provided with special odontodes on their opercular area that allow them to firmly attach to the branchial arches of larger fishes to feed on their blood. These are the feared candirus that are known to mistakenly enter the human urethra causing painful complications. Also, highly feared is the poraquê (*Electrophorus*) of the Gymnotiformes. Most of the species in this order are small and use their electrogenic abilities to generate an electromagnetic field around themselves to communicate and to perceive the neighbourhood electrically. In contrast, the poraquê grows to almost 2 metres long and can deliver electric shocks of up to 600 volts that are used to stun their prey.



Clockwise from top left: Former Teotonio falls in Rio Madeira, Brazil (Photo: Roberto Reis); New crisscross species of *Cetopsorhamdia* (Photo: Roberto Reis); Upper Rio Ucayali, Peru (Photo: James Albert); Redbelly piranha in Pucallpa market, Peru (Photo: Paulo Petry); *Hypostomus unicolor* (Photo: Roberto Reis)



## Threats

Just like in any other continent, many of these habitats are currently threatened by extensive deforestation, water divergence for irrigation, hydroelectric damming and alluvial gold mining. Fish species are further threatened by invasive species and overexploitation in some areas. Deforestation and the consequent habitat degradation, especially the severe siltation of river beds, is one of the main threats to thousands of small-to medium-sized rivers. Deforestation in South America involves both legal and illegal logging, clearing for cattle ranching and, especially, for expanding the agricultural frontier within the Amazon and the Atlantic forest. Hydroelectric damming affects fish populations in a threefold manner. The transformation of a lotic environment into a lake significantly changes the local community composition.

On a wider scale, dams regulate downstream river flow, thus disturbing the annual cycles of feeding and reproduction, and disrupt the migratory routes of many large fishes. This is particularly harmful in South America because migratory species move up rivers during the high-water season and spawn in the flowing current of the headwaters. Eggs and then larvae are immediately carried downriver by the turbid, well-oxygenated torrent and, under natural conditions, reach floodplains in the low portion of the river courses, where they will complete development. When a dam with a fish passage is built between spawning areas and the floodplains, the adults can migrate upriver and spawn, but the eggs either sink or are rapidly eaten by the many tetras that usually dwell in lakes, as they reach the reservoir.

Gold mining is also an enormous environmental problem that adversely affects aquatic organisms. Rivers are heavily dredged, in a process that usually completely destroys the river bed and banks. In addition to degradation of the physical habitat, the



**A chain of large dams have blocked migratory fish movements in basins such as the Parana, affecting fish biodiversity patterns and fisheries sustainability. Photo: Claudio Baigún**

typical use of mercury to separate the gold from the substrate, followed by vaporization of the mercury to yield pure gold, causes severe poisoning to miners and the environment.

Another important threat for South American fishes is posed by the numerous invasive species. This is less of a problem in the Amazon, but in many river drainages of Argentina, central and eastern Brazil, Chile and other countries, there is one to several introduced alien fish species. Aquaculture is the main factor in the introduction of alien species, with salmon introduced in south and central Chile while Brazilian rivers harbour around 13 introduced species from other continents, especially tilapia, carps, trout, ictalurid catfish, clariid catfish and others.

## Conservation

Despite the complex array of factors threatening South American freshwater fishes, there are few 'on-the-ground' conservation initiatives on the continent. The most important have been the fish assessments for the preparation of IUCN Red Lists for different countries or regions in South America. Probably the most ambitious of these is the current partnership between the Brazilian Ministry of Environment and IUCN, with the aim of assessing the conservation status of about 10,000 Brazilian species, including freshwater fishes and other organisms. Another important project of fish IUCN Red Listing, includes the lower La Plata River basin in Argentina, Paraguay and Brazil, which uncovered three endangered species, eight Vulnerable and three Near Threatened among the 184 assessed species. Finally, Peru is beginning the process of assessing the conservation status of their freshwater fishes through a partnership between the Peruvian Ministry of Environment and IUCN South America.

Priorities for future action include completion of the conservation status assessments regionally and at a continental (global) level, and then proceeding to the development of action plans. Also, instrumental for the future of fish conservation in South America will be increasing the Ph.D. level expertise in fish taxonomy and systematics, especially in non-Brazilian countries, improving museum facilities and inventory initiatives to uncover the undescribed fish diversity, and fostering new initiatives of 'on-the-ground' freshwater conservation.

*Text in this article is largely based on Reis (2013). Another important reference for South America and its fishes is Albert and Reis (2011):*

Albert, J.S. and Reis, R.E. (eds). 2011. *Historical biogeography of Neotropical freshwater fishes*. Berkeley, University of California Press.

Reis, R.E. 2013. Conserving the freshwater fishes of South America. *International Zoo Yearbook*, 47: 65-70.

## Spotlight on the Chair:

### Dr Roberto E. Reis

Roberto is primarily interested in freshwater fish biodiversity, evolution and conservation. His research programme mostly involves discovering and describing the fish diversity of South America and studying their phylogenetic relationships and biogeography. He has a Ph.D. from the University of São Paulo (1994), and is a Professor of Biology at the Pontifical Catholic University of Rio Grande do Sul, in Porto Alegre, Brazil, and a Curator of Fishes at the Museum of Sciences and Technology of the same University.

Roberto has extensive field experience collecting and studying fishes in many places in South America, especially in Brazil and Peru, and is currently involved as Taxon Coordinator (freshwater fishes) of the Brazilian Ministry of Environment initiative to assess the conservation status of all Brazilian vertebrates. He is a former President of the Brazilian Society of Ichthyology and a member of the IUCN SSC/WI Freshwater Fish Specialist Group since its beginnings.



Roberto castnetting  
in Purus River, Peru  
Photo: James Albert

## IUCN Red List assessments of freshwater fishes of the Tropical Andes

**Marcelo Tognelli and Neil Cox**

IUCN/Conservation International Biodiversity Assessment Unit, Betty & Gordon Moore Center for Science & Oceans, Conservation International

Last August, the IUCN-CI Biodiversity Assessment Unit and the Freshwater Biodiversity Unit, with a generous grant from the MacArthur Foundation, started a project ('Comprehensive assessments to understand and mitigate the impacts of development on freshwater biodiversity in the Tropical Andes') to assess the conservation status of the freshwater biodiversity of the Tropical Andes region. The project will encompass the complete extent of the Tropical Andes watersheds in Colombia, Ecuador, Peru and Bolivia (please see map on right). This area includes important watersheds, such as those of the Magdalena in Colombia, the Marañón in Ecuador and Peru, the Ucayali in Peru, and the Madre de Dios in Peru and Bolivia.

The primary goal of the project is to fill the data gaps that will allow conservation planning and sustainable management of freshwater biodiversity in the Andes. To meet this challenge, a comprehensive conservation assessment for an ecologically representative set of, approximately, 2,500 aquatic species in the Tropical Andes region will be performed. The target groups will be freshwater fishes, freshwater molluscs, freshwater plants, and dragonflies and damselflies (odonates).

Two additional noteworthy targets will be included in the IUCN Red List assessments: the utilization of species by people (e.g. food, ornamental trade), and species' vulnerability to climate change. The IUCN Red List and climate change vulnerability assessments will also provide baseline data to identify Key Biodiversity Areas (KBAs; catchments that are priorities for conservation action) based upon compiled biodiversity data and the review and validation of proposed KBAs by stakeholders.



This goal will enable proper representation of freshwater ecosystems in protected areas, and will promote the development of networks of protected areas that include regions of critical biodiversity in conjunction with regions that supply freshwater ecosystem goods and services to dependent communities.

# Brazilian Action Plans for freshwater fishes

**Carla Polaz**

National Center Research for Conservation of Freshwater Fishes, ICMBio - Instituto Chico Mendes (Chico Mendes Institute)

Since its foundation in 2007, the Chico Mendes Institute (ICMBio) has been responsible for the National Action Plans in Brazil. Its main mission is conserving Brazilian biodiversity, especially inside Protected Areas. Action Plans are public policies identifying and guiding priority actions to combat threats that endanger populations of species or environments (e.g. natural caves).

The ICMBio Instruction Act n. 25/2012 is based on strategic planning and provides a simple, but robust method that can be applied in all taxonomic or geographical levels. These levels may include a single species, or groups of species and subspecies, and can be set at global, regional or national levels.

The steps of an Action Plan, include analysing the information for the identification of direct threats and actors and defining objectives, goals and strategic actions to promote a change in the risk of species extinction through participatory planning workshops. Following this, ICMBio approves the publication of an executive summary and the Action Plan's book and continues to oversee the implementation of recommended actions. In each completed year after the first workshop, a new monitoring meeting takes place to establish the status of actions: concluded (blue signal); on progress in time (green signal); ongoing with problems (yellow signal) or delayed (red signal). An advisory specialist group systematically follows the implementation of actions until the end of the Action Plan five years later. To warrant that the Action Plan will have greater implementation

success, the process includes multilateral participation, aiming to establish a pact involving various segments of government, non-governmental organizations, conservation experts, representatives of local communities, the private sector and other key stakeholders.

Chico Mendes Institute currently controls 44 Action Plans for fauna species with the support of the Project PROBIO II/MMA, four of them designed for freshwater fishes:

[Action Plan for the threatened species of the Paraíba do Sul watershed, that comprises ten fishes, one turtle, three crustaceans and three mollusks \(all from freshwater habitats\).](#)

[Action Plan for the threatened species of the Mogi, Pardo, Grande and Sapucaí-Mirim watersheds \(Upper Paraná basin\), that comprises fourteen endangered fishes.](#)

[Action Plan for the threatened species of Rivulidae family, that comprises more than 50 annual fishes.](#)

[Action Plan for the threatened species of the São Francisco watershed, that comprises five fishes and four molluscs in the Brazilian Savannah \(Cerrado\) \(under construction\).](#)

For more details of all Chico Mendes Institute Action Plans, please, visit the website: [www.icmbio.gov.br/portal](http://www.icmbio.gov.br/portal).



*Salminus brasiliensis* (also known as "dourado" in Brazil) is an alien species in the Paraíba do Sul River basin and a huge threat to native fishes. Photo: Leonardo Milano.

# U.K.'s rarest freshwater fish 'reappears'

Ian J. Winfield<sup>1</sup> and Andrew R. D. Gowans<sup>2</sup>

<sup>1</sup>Centre for Ecology & Hydrology, Lancaster Environment Centre, UK; <sup>2</sup>Environment Agency, Penrith, UK.

Bassenthwaite Lake, home once again (?) to the vendace  
(Photo: Centre for Ecology & Hydrology)



The U.K.'s rarest freshwater fish, the vendace (*Coregonus albula*), has made an unexpected 'reappearance' in Bassenthwaite Lake in north-west England more than a decade after its last sighting. A fish community survey undertaken in September 2013, within a long-term monitoring programme, recorded a single vendace. The small size of the fish (54 mm fork length) makes it likely to be an under yearling, which hatched during the previous spring.

Only four vendace populations have ever been recorded in the U.K., with records from two lochs in south-west Scotland (Castle Loch and Mill Loch) and Bassenthwaite Lake and the nearby Derwent Water of the English Lake District in north-west England. The populations in Scotland were lost many decades ago, probably as a result of local nutrient enrichment, and vendace were last recorded in Bassenthwaite Lake in 2001 (Winfield *et al.*, 2012, 2013). Until recently it was believed that only the Derwent Water population remained, along with a refuge population in Loch Skene in south-west Scotland established using eggs from Bassenthwaite Lake in the early 2000s.



Single vendace recorded at Bassenthwaite Lake (Photo: Centre for Ecology & Hydrology).

There are three possible origins for the fish found this autumn. First, it is possible that vendace have actually survived in Bassenthwaite Lake for the last 12 years at a very low abundance below the limit of detection and may now be increasing in abundance. Second, it is possible that the fish has arrived in Bassenthwaite Lake by moving down the River Derwent from the population in nearby Derwent Water. Third, it is possible that such downstream movement happened some time ago and that the individual is the locally-spawned offspring of such colonisers. DNA obtained from this vendace is to be sequenced in an attempt to shed some light on this issue.

This finding of a single vendace does not, of course, indicate that a self-sustaining population is present in Bassenthwaite Lake, but it is a very pleasant surprise and gives great encouragement to everyone involved in the restoration of the lake and its fantastic wildlife. Continued monitoring of the fish community will help us to understand what has happened and will continue to inform appropriate local conservation actions, with perhaps also some lessons for wider issues of fish conservation.

## References

Winfield, I.J., Adams, C.E., Bean, C.W., Durie, N.C., Fletcher, J.M., Gowans, A.R., Harrod, C., James, J.B., Lyle, A.A., Maitland, P.S., Thompson, C. and Verspoor, E. 2012. Conservation of the vendace (*Coregonus albula*), the U.K.'s rarest freshwater fish. *Advances in Limnology* 63, 547-559.

Winfield, I.J., Adams, C.E., Bean, C.W., Durie, N.C., Fletcher, J.M., Gowans, A.R.D., Harrod, C., James, J.B., Lyle, A.A., Maitland, P.S., Thompson, C. and Verspoor, E. 2013. Positive steps for conservation of the vendace (*Coregonus albula*), the UK's rarest freshwater fish. *Newsletter of the IUCN SSC/WI Freshwater Fish Specialist Group* 1, 14-15.



# In search of the Mangarahara cichlid

**Brian Zimmerman**

Zoological Society of London, UK



**Two old male *Ptychochromis insolitus* at ZSL London Zoo**

In late 2012, at the International Aquarium Congress in Cape Town, Sam Furrer of Zurich Zoo and I spoke about what zoos and aquariums were doing with Madagascan fishes. Several institutions kept and bred a variety of species, but we didn't know which species or how many individuals were held in captivity. We agreed to conduct a survey to find out who was working with them, and to develop an inventory as a starting point. Little did I know, at that time, this was the start of a mission to save a species from extinction.

Sam sent out the survey and in a few months revealed the results. Over 40 institutions responded to the survey, mostly in Europe, but a few from North America too. About a dozen collections in Europe kept Malagasy fishes and there were about 15 species in the Zoological Society of London (ZSL) collections. One species stood out for me: the Mangarahara cichlid, *Ptychochromis insolitus*. The survey showed that only Berlin Zoo and my institution, ZSL, were keeping this species. Both of ZSL's fish were old males that arrived from hobbyists in 2002. We originally received about a dozen fish – all siblings – but these two males were all that remained. I called Rainer Kaiser at Berlin Zoo and asked him about his fish. He said he had a pair and that they spawned regularly in the exhibit tank, but that the fry were usually eaten by tank mates. After our discussion he agreed to set up a separate tank for his pair and attempt to rear up some youngsters. Only two weeks later I had an email from Rainer telling me that the male had killed the female. That left only three males known in Europe. It occurred to me that this could be the end of the species.

I had read that the Mangarahara River was nearly dry and the Amboabao River, its tributary, was reduced to a few pools by 1999. Most of the water had been diverted for rice farming and a drought affecting Madagascar had made the situation worse. Worried that captive populations may be the last hope of survival for *Ptychochromis insolitus*, I contacted the hobbyists who originally gave us the fish in 2002 to see if they had any more of this species. They no longer kept fish, but referred me to someone else. Over the next month I followed up a number of leads that all became dead ends.

Over the following few months I made a habit of pointing out our two males to visitors to the aquarium, saying that they might be the last of their kind. People were horrified and asked what we were doing about it. I spoke to my press team about launching an appeal to the public to see if anyone was keeping the Mangarahara cichlid. Getting fish cover in the press isn't easy for a zoo curator when you compete with tigers and gorillas and other charismatic fur-balls.



**The now dry Mangarahara River**

# WANTED

## FEMALE MANGARAHARA CICHLID



FOR VITAL CONSERVATION BREEDING  
PROGRAMME TO SAVE A SPECIES

EXTINCT IN THE WILD, THERE ARE ONLY 3  
KNOWN INDIVIDUALS REMAINING... ALL MALE

If you know or own any female  
Mangarahara cichlids please email us at  
[fishappeal@zsl.org](mailto:fishappeal@zsl.org)

ZSL  
LONDON  
ZOO

Surprisingly, my press team thought it was a great idea and within a week we launched the “Fish Appeal” requesting anyone with information about this species to get in touch. The mainstream media were captivated by this story and intrigued by my description of the fish as “gorgeously ugly.” Suddenly it was about finding a mate for two old men. I was grateful that a separate account was set up for incoming emails because the response was overwhelming. In addition to hundreds of well-wishers and a few sarcastic responses saying extinction was natural; let them die, there were a few dozen solid leads to follow up on. Unfortunately, all of these strong leads back to the same few people that kept the species in the 1990s and early 2000s, but no longer had them.

Then I had an email written in French from a businessman called Guy Tam Hyock, who owned a number of aquaculture fish ponds in northeast Madagascar. He said he knew a fisherman from the area of the Mangarahara River that had recently caught a fish that he believed may be *Ptychochromis insolitus*. He said there small grant from the Foreign and Commonwealth Office to help fund the trip. The grant was successful, and with ZSL and Toronto Zoo funding the remaining amount, we started to plan logistics.

The “Fish Appeal” had also put me in touch with Alex Saunders from Denver Zoo and Tim McCaskie from Toronto Zoo – both of whom had travelled to this region of Madagascar previously. Tim said he was planning a trip to Madagascar in late 2013 and would be happy to work together trying to find the *P. insolitus*. Tim was in touch with Tsilavina Ravelomanana from the University of Antananarivo, who was one of the biologists, Alex had worked with before. Tsilavina agreed to come along with us and help with the in-country logistics. One of my aquarists, Kienan Parbles would also join us since he had been to Madagascar before. I also had a call from Tim Smart, the British Ambassador to Madagascar. He’d heard about the Fish Appeal and wanted to know if there was anything he could do to help. Tim suggested I apply for a

small grant from the Foreign and Commonwealth Office to help fund the trip. The grant was successful, and with ZSL and Toronto Zoo funding the remaining amount, we started to plan logistics. We assembled our team and planned the trip for November when the dry season would allow the best access to the region. Two teams would head north from Tana and we would try to cover as many of the flowing tributaries of the upper Sofia drainage as possible, using local knowledge and Tsilavina’s previous experience. We agreed to save the site, Guy had reported the fish from, for last since it was most remote. I was told that we would need a month to conduct the trip since things in Madagascar can take a long time. Having not travelled to Madagascar before I was glad for this advice.

After four days of logistical planning in Tana, we headed north along an increasingly bumpy, potholed road. Over the next few days we searched for flowing water and found very little. The landscape was charred with burnt trees, and fires were burning everywhere. Locals burn the grass before the rainy season to bring

fresh growth for cattle. This deforestation and burning practice has very clearly destroyed most of the watersheds in Madagascar. Rivers didn’t flow and most were just swathes of sand with no water. It was depressing and we were losing hope of finding any fish, let alone the one we came to track down.

Eventually, we ended up at the Maravato River, which still contained water. There was little flow, but the pools were deep and there were still some trees along the bank. We organised

ourselves to survey this river with a variety of methods – traps, seine nets

and dip nets. The whole village of Marovato came down to watch or join in. Chaos reigned and doing anything organised was difficult. The locals thought we were crazy for wearing chest waders rather than just jumping in the water. Everyone stared at us curiously, periodically laughing hysterically at something we did. I’ve never had to do water quality analysis in front of an audience of 50 people before. Nevertheless we wanted to get some good data on the habitat, should the fish be found here.



Cartoon created by ZSL aquarium volunteer David Shenton

[Grab your reader's attention with a great quote from the document or use this space to emphasize a key point. To place this text box anywhere on the page, just drag it.]



### Testing water quality with an audience in Marovato and one of the better roads.

We ploughed on with fishing and sampling for several hours, but the only fish we caught were lots of tilapia and a few *Sauvagella robusta*, which seemed to die as soon as you looked at them. A few local women caught some species of *Pachypanchax* to show to us and Tsilavina took a few as specimens as he hadn't seen them before. By the end of the day we realised that there would be no *Ptychochromis* here. Even the locals didn't recognise them in photographs, so we realised this was a dead end.

Over the next several days we repeated similar sampling experiences; sometimes we would catch no fish, other times just tilapia or a few gobies. Eventually we decided to head up

north along the Sofia to Antsakabry to check tributaries at higher elevation in the hope there would be more water and fewer tilapia. Our jeeps were pretty battered and the roads were hardly what you would call 'roads'. Finally, two weeks into the expedition our lead jeep started to have serious problems and we needed to rethink the plan. We were running out of time and we wanted to be able to reach the site where *P. insolitus* had most recently been seen, and fish for it thoroughly. So we turned back and headed for Marotandrano.

As we pulled into Marotandrano a young fisherman ran towards us and proudly presented a dried Mangarahara cichlid. "Is this what you are looking for?" he asked via a translator. "Yes, only slightly less dead." I asked him where he found it and he promptly led us down a dirt track for two hours to a pool in the non-flowing Amboaboa River. He and three fellow fishers jumped into the pool and pulled out a small fish trap. They shouted: "Joba mena!" That's the local name of *Ptychochromis insolitus* I soon learned. What does it mean? "Red girl" apparently. The male fish have red edges to their fins when fully mature as I knew from the fish we kept at ZSL London Zoo. Red boy would have been more appropriate I suppose. In any case at last we had a live Mangarahara cichlid! It was a juvenile male about eight centimetres long. In the next two hours before nightfall seine netting yielded an additional three fishes. We also caught *Paretroplus nourissati*, *P. gymnoproperculatus*, and *Pachypanchax sp. Sofia*. We photographed and measured these fishes then released them and made plans for a full sampling session the next day.



A dried *Ptychochromis insolitus* presented by a fisherman in Marotandrano



**A plate of dried cichlids presented to the team**

That night word got around that there were some out-of-towners looking for Joba mena and I was presented with a plate of dried specimens. I asked them not to bring me any more like this. Instead we made a plan to sample in six locations along the river to see if we could determine the extent of the species' remaining range. The team divided up, and over the next few days, we fished and collected data. Ultimately, we found them in three of the six sites, with the downstream sites too degraded to support native species and the last upstream site too deep to fish properly. Further upstream was the Marotandrano Special Reserve. This reserve was the only reason any water remained in the Amboaboa. I wanted to check the river in the reserve, but we needed to get special permission, which took a day to organise.

A day of travel by very bad road and steep hill-walking lead us to the border of the special reserve. We weren't allowed to fish here, but the water was so clear that you could easily see rich aquatic life, such as amphibian larvae and aquatic insects. No fish though. We asked at the small village closest to the reserve's boundary and they were unfamiliar with Joba mena. They knew of some small fish: "Zoono" a catch-all phrase for *Pachypanchax* and anything else of that size. Tsilavina was hopeful they might be *Rheocles derhami* as we managed to catch a single individual downstream the day before. But further sampling didn't find any.

We were excited that *Ptychochromis insolitus* and its sympatric species community still existed in the wild in Madagascar, but deeply concerned with the state of their habitat. Rice farming and its associated water abstraction, intensive fishing including the use of poisons, deforestation and erosion, as well as the presence of tilapia and *Gambusia* were big concerns and we needed to make a decision about our next move. It is clear that the fish were not really safe where they were and in a few more years it is likely they will be gone from this area – and since there are no breeding populations in captivity, they will become extinct.

We decided to buy time for the species by catching a few individuals and moving them to Guy's ponds near Andapa. This wasn't originally part of the plan; the expedition was just meant to see whether there were any *Ptychochromis insolitus* in the wild and then form a plan. But we knew we needed to act quickly, whilst we were still in Madagascar, or there was a big risk we wouldn't have a second chance. Fortunately Tim had brought a selection of "breather" bags with him for moving *Bedotia* and *Pachypanchax* if needed. We went to the market in the village and bought a number of baskets and bags and planned to go fishing in late afternoon: to avoid the hottest part of the day. We worked in two teams covering two areas so we had a better chance of catching a suitable number of fish. We decided to collect all the sympatric species as well since their survival was just as precarious as *Ptychochromis insolitus*. It seemed like half of the village decided to join us and help with fishing. We set a target of 20 fish of each species – this was all we could carry with the number of bags we had. By dusk we managed to catch our target of 20 *P. insolitus* as well as 22 *Paretroplus nourissati*, 8 *P. gymnopreoperculatus* and 15 *Pachypanchax sp. Sofia*. We carried them back to the Catholic mission where we were staying and repacked them individually for the long journey to Andapa. It took us nearly 30 hours of continuous driving to get there, down an impossibly bumpy road.



**Brian Zimmerman with the first live *Ptychochromis insolitus* caught**

Amazingly all, but one of the fish, survived the trip. Guy was successfully breeding a number of Malagasy endemic species in his ponds and I was impressed by the selection of species and well as the number of individuals he was able to breed. Our Amboaboa fish were all placed directly into a new pond and within a day we observed them swimming about and behaving normally. At Christmas I had an email from Guy to say that he spotted two pairs in the pond – one guarding eggs and the other guarding fry. This was most welcome news, especially since one of our two remaining males at ZSL had died on Christmas Eve.

So it seems that all is not lost for the Joba mena. There is new hope for the species in Madagascar, even if its survival in the

Amboaboa is doubtful. We will work with others to develop a conservation strategy for the species, following on from what the Durrell Wildlife Conservation Trust are doing for *Oxylapia polli* in the Nosivolo River and adapting this project for the Amboaboa where feasible. We will also investigate whether a translocation is feasible – moving fish upstream to the special reserve where they will have greater protection. Whether or not any *Ptychochromis insolitus* ever come to ZSL London Zoo is still undecided. If a conservation plan can be successfully achieved in Madagascar there will be no need to bring them to the UK. However, if our partners in Madagascar would like our support, we will be happy to have the species back again.



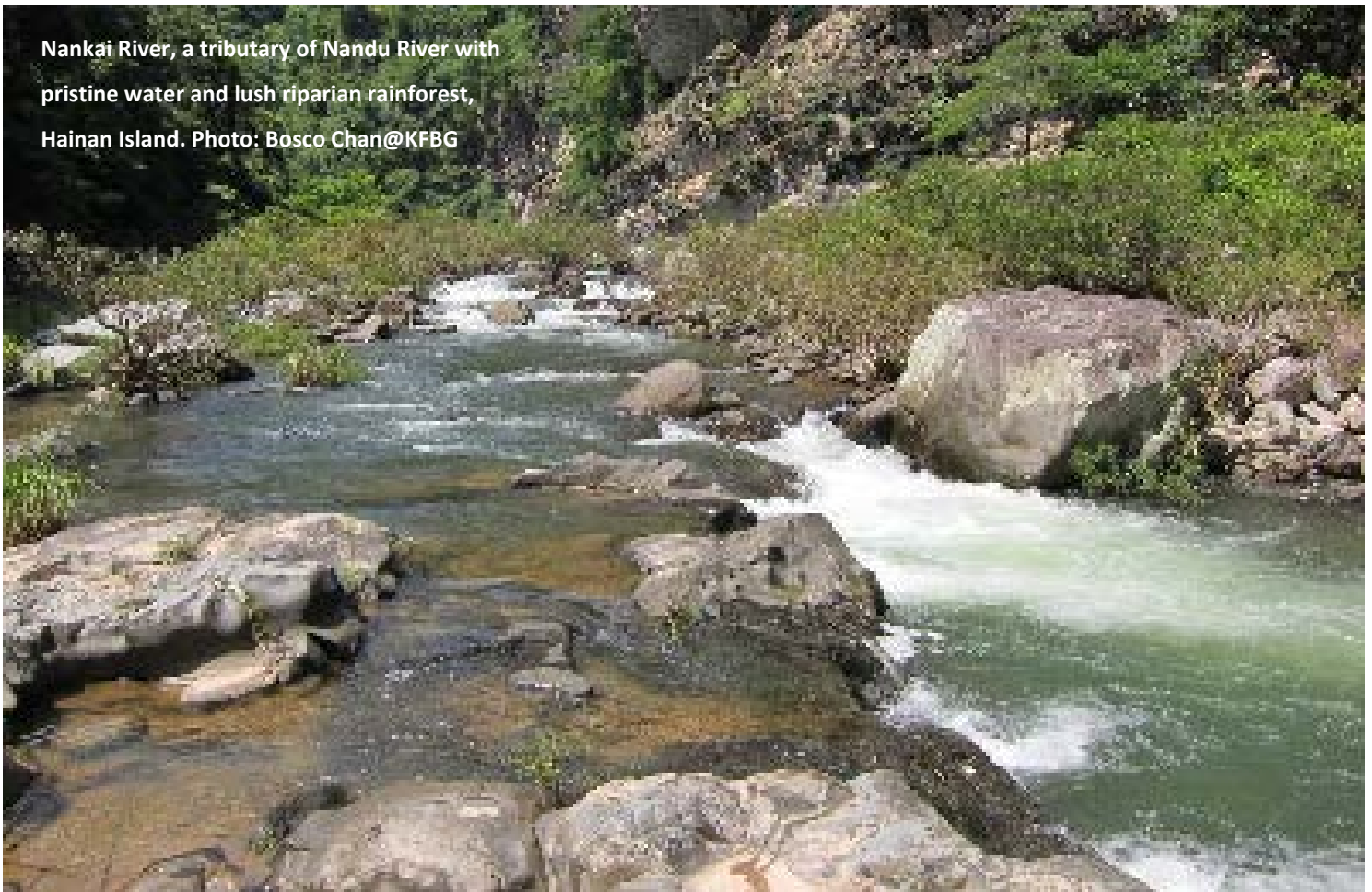
Clockwise from top left: Local fishermen collecting a fish trap in the Amboaboa River; Local fishermen helping to catch *Ptychochromis* and *Paretroplus*; Releasing fish in Guy's ponds in Andapa after a 30 hour journey; Sorting and measuring the catch from the Amboaboa River.

# A community-led fish sanctuary initiative on Hainan Island, China

**Bosco P.L. Chan**

Kadoorie Conservation China, Kadoorie Farm & Botanic Garden, Hong Kong & Hainan Yinggeling Nature Reserve, Baisha, Hainan

Nankai River, a tributary of Nandu River with pristine water and lush riparian rainforest, Hainan Island. Photo: Bosco Chan@KFBG



Hainan Island is China's southernmost province in the South China Sea. With roughly the same latitude as Hawaii and twice the land size (~33,000km<sup>2</sup>), it supports lush tropical forest and a coral-fringed coastline. The tallest mountain, Mt. Wuzhishan, exceeds 1,800m above sea level and there are 13 major rivers with a catchment size over 500km<sup>2</sup>. The largest of them is the Nandu River, which runs 330km from the mountainous interior to the Gulf of Tonkin; its large size and diverse habitats supports a rich fish fauna with over 100 species recorded thus far, including Hainan-endemics, such as *Hainania serrata*, *Saurogobio immaculatus* and *Squalidus minor*. However, growing human population and infrastructure development are putting pressures on the river ecosystem and its biota; water is being polluted, habitat quality deteriorating, and fish populations overfished.

Since late 2006, Kadoorie Farm & Botanical Garden (KFBG) has been working in Yinggeling Nature Reserve, which is Hainan's largest protected area and covers the major tributary of

the Nandu River. Field survey, literature search and village interviews revealed that over 50 fish species used to occur in this tributary, called Nankai River, which has excellent water quality and habitats. Sitting deep inside the reserve, along Nankai River, is an ethnic minority village called Daoyin. Due to its remoteness and impoverished economy, Daoyin villagers traditionally rely heavily on stream fishes to supplement their diet. Things were fine until the 1980s, when "technological advancement" brought electrofishing, dynamite-fishing, cheap chemicals as fish-poison, as well as concrete to build weirs and dams; all to the detriment of the fish fauna. Villagers reported a sharp decline in fish diversity and abundance, with extirpation of the more sensitive species, like *Hypophthalmichthys harmandi*, *Spinibarbus denticulatus*, *Bangana discognathoides* and *Coreoperca whiteheadi* (Chan and Chen, 2008).



Fearless *Spinibarbus caldwelli* came close to inspect the author inside the Daoyin fish sanctuary, Hainan Island.  
Photo: Bosco Chan@KFBG

To engage the local communities in conservation, KFBG and Yinggeling decided to work with Daoyin Village in protecting their fishes, as they can easily associate fishes with their daily life, which offers a good entry point to understanding the importance of conservation. We started by staying in the village, conducting field work and interview surveys on fish diversity and utilisation, and sharing our views on how the local communities could sustainably harvest their fish resources for the benefit of their future generations. Our enthusiasm in protecting their food (i.e. the fishes) got them interested, especially when we were the first ever group snorkelling and later on scuba diving in their river!

We soon introduced the idea of establishing a fish sanctuary in a section of the river, in which fishing is strictly prohibited to allow recovery of the fish population. We thought that a flagship species would help us spread the message and, to our expectation, found that their most popular game fish is the large-sized *Spinibarbus caldwelli* (locally known as junyu), which is becoming rare due to overfishing. Some taxonomists considered it conspecific with Taiwanese *S. hollandi*, but see Tang *et al.*, 2005. Interestingly, the junyu superficially bears striking resemblance and has similar habitat requirements (swift, clear, rocky-bottomed hillstreams) to species in the genus *Tor* (commonly known as mahseer) highly esteemed by mountain tribes in many Asian countries (e.g. *T. tambroides* of SE Asia, *T. putitora* of the Himalayas).

We also made it very clear that the management of a “mini” protected-areas, such as the ones being proposed in sections of the Nankai River, should rest with the local community, to guarantee ownership. Before long the villagers were convinced, and decided to set aside their best “junyu pool” as their fish sanctuary.

Author and colleague conducting a fish survey in the Daoyin fish sanctuary, Hainan Island. Photo: Jiang Enyu@Xinhua News Agency





Subsequent monitoring as well as reported catches outside the fish sanctuary confirmed the effectiveness of it, with a shoaling junyu population in the fish sanctuary and less effort needed to harvest enough fish for a meal outside. Today, the lucky visitors are treated with tens of >30cm long junyu greeting them close, or even nipping their toes, if they are patient!

In 2012, to promote this idea to a wider community and to further enhance the conservation value of the fish sanctuary, we organised a grassroots workshop about the fish sanctuary, during which we also released some fingerlings of a locally-extirpated species, *Spinibarbus denticulatus*, collected from a downstream site in middle part of the Nandu River. It was the giant of Nankai River, being able to grow to over 20kg; but it had been extirpated in the 1980s as the species, according to the villagers, are particularly susceptible to dynamite-fishing! The Daoyin villagers have fond memories of the species and indicated they would love to have it back, so that their grandchildren can see it swimming in their river again. The event was attended by almost 100 people, mainly chiefs from surrounding villages and local government officials, and many have voted to set up their own fish sanctuaries in their respective villages. I can testify they are serious about keeping their word, as my recent exploratory scuba diving survey at a downstream village attracted almost the whole village to the stream bank waiting for an hour, just to show their desire to have us helping them to establish a fish sanctuary!

#### References

Chan, B.P.L. and Chen, X.L. 2008. Species diversity and distribution of freshwater fishes at Mt. Yinggeling, Hainan Island, China. *Biodiversity Science* 16(1): 44-52. (In Chinese with English abstract)

Tang, Q., Liu, H., Yang, X. and Nakajima, T. 2005. Molecular and morphological data suggest that *Spinibarbus caldwelli* (Nichols) (Teleostei: Cyprinidae) is a valid species. *Ichthyological Research* 52: 77-82.



Author conducting interview on changes in fish diversity and abundance in Daoyin Village, Hainan Island. Note the t-shirt with *Spinibarbus caldwelli* we distributed. Photo: Jay Wan@KFBG



Chiefs of surrounding villages reintroducing *Spinibarbus denticulatus* into the Daoyin fish sanctuary, Hainan Island. Photo: Jay Wan@KFBG



Participants of the grassroots fish sanctuary workshop in front of the Daoyin fish sanctuary, Hainan Island. Photo: Jiang Enyu@Xinhua News Agency

# Killifishes on the edge

**Jörg Freyhof**

Zoological Research Museum Alexander Koenig, Leibniz Institute for Animal Biodiversity, Germany

---

While killifishes are most species rich in the wet tropics, there are two species of *Valencia* in the European endemic family Valenciidae and 25 species of *Aphanius* (Cyprinodontidae) accepted as valid in the Western Palearctic. Several additional species exist, but as there has been no comprehensive taxonomic review, only these



*Gambusia holbrooki*

27 species had been assessed against the IUCN Red List criteria. From all the 27 Western Palearctic killifishes, 18 (65%) have been assessed as threatened, 10 (43%) of them as Critically Endangered. This ranks killifishes just behind sturgeons as the most threatened group of Western Palearctic freshwater fishes. The high threat levels are due to their high vulnerability to alien species, especially *Gambusia holbrooki*, which is now almost omnipresent in killifish habitats and the fact, that many killifishes are restricted to a few or just one spring areas, lakes or lagoons in arid or semiarid climate regions.

Here we bring together five case studies at different progress levels, from long-term conservation experience for *Valencia hispanica* and *Aphanius sirhani*, a new project on *A. transgrediens* in Turkey to the just discovered *A. saourensis* and *A. farsicus*, which are in a need of new conservation projects.

## What to do if there is no more water? Conservation of *Aphanius sirhani*, the Azraq Killifish

**Nashat Hamidan**

Royal Society for the Conservation of Nature, Jordan; Centre for Conservation Ecology and Environmental Science, Bournemouth University, UK.

---

The Azraq killifish, *Aphanius sirhani*, is endemic to the Azraq wetland in Jordan. This wetland used to be a large oasis fed from aquifer water. It was distributed over around 27 km<sup>2</sup>, where the aquifer naturally provided around 25 million cubic metres of water annually to the surface. This water was the water that exceeded the aquifer's capacity. Since the 1980s, water was abstracted in huge quantities from the phreatic layer to feed the demands of Jordan's capital Amman, and other large cities, after which, the water level dramatically dropped, until the oasis completely dried out in 1992. Part of the Oasis was restored and maintained in what is known now as the Azraq Wetland Reserve to resemble a sample of what the former oasis looked like. This restoration started in

1994, where 8% of the marshes (based on their 1960s extent) have been restored. During this restoration, the Azraq killifish was maintained in the reserve and outside by captive breeding.

The battle against extinction started in 1998, when the Royal Society for the Conservation of Nature (RSCN), the organization responsible for nature conservation in Jordan, decided to integrate the endemic killifish conservation programme into the rehabilitation project. Thus, the conservation of killifish started with a baseline survey to investigate the situation of the killifish and, if it is not extinct, to determine what the future plan would be.



***Aphanis sirhani*; Male [Left] and Female [Right]. Photos: Nashat Hamidan**

Research work carried out in corporation with the Limnology Department of the University of Vienna, showed the species existed in very low numbers. A rescue mission started immediately, and part of the wild population was collected for special stocking and propagating programmes. Two years later, in 2002, the first trial release took place, and this was tested in 2003 when another release was also made. Both releases were monitored in 2004, but both showed redundant improvement in the population size of the endemic killifish, and the species was still at the edge of extinction.

A detailed understanding for the survival requirements of the Azraq killifish became a priority, and this was applied through a detailed three yearlong study of the species' life history traits. The study obviously demonstrated the ability of the species to adapt to the well identified harsh environmental conditions: water shortage and fluctuation, habitat loss, and the impact of alien species, including competition for food, nursery grounds, and the direct predation of adults, juveniles, and eggs.

Scientific evidence-based conservation actions were planned, brave but massive rehabilitation efforts took place, and were guided by the 1960s aerial photos and maps that showed the water regime at that time. The remaining wild killifish were removed and secured in a semi-natural pond, and then most of the wetland habitats were dried in preparation for restoration. The water system was redirected to follow the old pathways after they had been cleaned; water depth was designed to be mosaic; shorelines were created; and a new large water pond was created explicitly for the killifish and no other species.

After this work was finished, water was pumped again into the new habitat, and 1,250 killifish were introduced on 28<sup>th</sup> February 2006. Six months later, a monitoring survey of the killifish took place, and for the first time in a long time it was possible to obtain

a full net of the endemic Azraq killifish. Also, for the first time, the size of the population exceeded those of alien fish populations. The killifish population continues to increase, and it is now the only fish species in the newly established pond. Moreover, it co-exists with the introduced cichlids in the old modified ponds, but in large numbers, and since 2006 it is the most abundant species. Despite this success, the species remains fully conservation dependent, as water must be pumped into the wetland. Also, despite the fact that the killifish coexists with the alien cichlid species, the latter have been a problem; it has not been possible to fully eradicate them, so they still need to be continuously controlled since they are present in all, but one, secured large pond in the reserve. The overall success of the programme is integrated into school curricula. Also, several awareness programmes were running in parallel to the field work. Specimens of living *Aphanis sirhani* were also secured outside Jordan in the Breeding Centre of Endangered Arabian Wildlife in Sharjah, United Arab Emirates.

This success would not have happened without the great effort and help of many people and organisations: first The Royal Society for the Conservation of Nature, in particular Azraq Wetland Reserve team; also the Limnology Department from the University of Vienna, and especially Mr Anton Weissenbacher, Horst Zornig. Chester Zoo, through the coordination of Professor Gordon McGregor Reid, kindly provided funds both for the project and the detailed survey. Fared Krupp, Chris Goldspink, and Zuhair Amr provided technical contributions. This project also received several funds from different donors, including the Ford Conservation and Environmental Award, The Netherlands Embassy in Amman, Jafar Aquatics, and a Ramsar Convention small grant. The project heroes are not forgotten, they are Mr Shareef Tarabai, Mr Anwar Al-Halah, and Mr Mohammed Abu al-Dheeb, all of whom are part of the local staff working in the Azraq wetland reserve. They allocated their time, effort, and resources to make this project a success.

# Tilting at windmills: Conservation of *Valencia hispanica*

**Matt Ford**

Seriously Fish

In his novel “El ingenioso hidalgo don Quijote de la Mancha” Miguel de Cervantes Saavedra’s hero Don Quixote contests a famously hopeless battle. Sadly, this may also be proving true of the world’s longest-established conservation effort for a non-commercial freshwater fish species. *Valencia hispanica*, another Iberian native, continues to struggle for survival.

Restricted to a small portion of Spain’s Mediterranean coast and known locally as “samaruc” it is arguably among the most endangered freshwater fishes in the world. It has been included in Appendix II of the Bern Convention (a binding international legal instrument in the field of nature conservation, which covers most of the natural heritage of the European continent and extends to some States of Africa) as a highly endangered species since 1979. It was also designated a priority for conservation in Annexes II and IV of the European Union Habitats Directive 92/43/EEC. In 1996 it was assessed as Endangered by the IUCN, but reclassified as Critically Endangered in 2005 due to an apparent population decline in excess of 80% since the mid-1990s (Crivelli, 2006).

The samaruc is also considered In Danger of Extinction in both the Spanish Catalogue of Endangered Species and Annex I of the Valencian Catalogue of Endangered Species, while in Catalunya it is included as a Species of Special Interest under Law 3/1988 for the protection of animals. An extensive regional programme of captive breeding and release has been ongoing for more than two decades and the species has also featured in four EU-Life projects during

this period. In a legislative sense it is thus among the most well-protected freshwater fish species in Europe - but alien invaders cannot read the laws.

Of the nine remaining populations two are thought to have been released by aquarists, and one is in a drastic state while the other inhabits a tiny, fragile lagoon. The remaining seven have all been heavily augmented or created artificially using captive-raised fish, with several attempts at the latter having also been abandoned. Thousands of individuals continue to be released each year, but there is little sign of improvement at most localities (BDBCV, 2013). The unfortunate implication is that if habitat quality cannot be further improved this jewel of Valencia will soon join ‘The Ingenious Gentleman of La Mancha’ and other national treasures in the ranks of Spanish legend.

## References

BDBCV - Banco de Datos Biodiversidad Comunidad Valenciana: <http://bdb.cma.gva.es>

Crivelli, A.J. 2006. *Valencia hispanica*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013

Generalitat Valenciana (eds). 1999. Peces Ciprinodóntidos Ibéricos Fartet y Samaruc. Conselleria de Medio Ambiente, Generalitat Valenciana. 357 pp.



Rio Bullent, Pego-Oliva Natural Park, Valenciana home to one of the last remaining natural populations.

Insert: *Valencia hispanica*. Photo: Matt Ford

# Critically Endangered freshwater fish species of North Africa likely to be extinct in the wild

Mahmoud Bacha<sup>1</sup>, Chabane Benamirouche and Jörg Freyhof<sup>2</sup>

<sup>1</sup> Université du Littoral Côte d'Opale, France; <sup>2</sup> Zoological Research Museum Alexander Koenig, Leibniz Institute for Animal Biodiversity, Germany

The freshwater biodiversity of North Africa has been assessed against the IUCN Red List criteria in 2010 (García *et al.*, 2010). With 27 % of the freshwater fish species threatened, their status is surprisingly good for such an arid area. Only one species, *Aphanius saourensis*, had been assessed as Critically Endangered.

*Aphanius saourensis* is endemic to the Oued Saoura basin in the Algerian Sahara. Once it might have been widespread throughout the basin, but when it was last found, in 2004, only one remnant population (near Mazzer) remained. When the species was described in 2006 (Blanco *et al.*, 2006), it was already mentioned that “*The presence of introduced North American Gambusia sp. poses a serious threat, with current densities of Gambusia to Aphanius being more than 100 to one. Excessive groundwater withdrawal for agricultural purposes, the drying of wetlands, and water pollution are, along with the introduced Gambusia, the major threats to the survival of this species. Its survival is unlikely in the wild, but a small captive breeding programme is underway*”. Such captive populations exist in several European countries. In 2013, the German Killifish Association (DKG) in collaboration with Jörg Freyhof (also IUCN SSC/WI FFSG Regional Chair for Europe) funded a small project to support Mahmoud Bacha and Chabane Benamirouche from Algeria to search again for the species at its type locality and other water bodies in the Oued Saoura. Mahmoud and his team spent five days in the area and checked the type locality and all adjacent water bodies, but

only got depressing results. Besides *Gambusia holbrooki*, only alien tilapia (*Oreochromis niloticus*) could be found. There was no trace of the *Aphanius*. Naturally, a negative record is difficult to make and there might be still the chance to re-discover the species in the wild. But it is at least quite likely, that the species is now extinct in the wild.

Based on the actual results, we should treat the captive stock in a way as if the wild population is gone. The next question is, could the *Aphanius* be re-introduced to the wild? As its extinction in the wild was caused by the impact of alien species, these must be removed from future re-introduction sites. This might be a real challenge, even in a dry area as the Algerian Sahara.

This is the third extinct freshwater fish species in the Maghreb after the extinction of *Salmo pallaryi* from its only lacustrine habitat in Morocco, and *Luciobarbus antinorii*, which vanished from its habitat in the Tunisian Sahara. It should be noted that there are at least four more North African species, which might be at the very brink of extinction: *Aphanius apodus*, *Barbus reinii*, *Ptercapoeta maroccana* and *Salaria atlantica*. These have either not been assessed yet, or have been assessed as Data Deficient as no data were available from the poorly known area. More detailed fieldwork is urgently needed to search for them now, while there is some small chance they are still extant.



Habitats in the Oued Saoura basin, Algerian Sahara

# *Aphanius farsicus* might be extinct in the wild

Hamid Reza Esmaeili<sup>1</sup> and Jörg Freyhof<sup>2</sup>

<sup>1</sup> Department of Biology, Shiraz University, Shiraz, Iran; <sup>2</sup> Zoological Research Museum Alexander Koenig, Leibniz Institute for Animal Biodiversity, Germany

---

The freshwater fish biodiversity of Iran was assessed by us against the IUCN Red List criteria in the summer of 2013. While the results are not yet publically available, it is already clear that the area is of great conservation concern. One of the species which we might have already lost since 2013 is the Fars tooth-carp *Aphanius farsicus*, an endemic species in the endorheic Lake Maharlu basin. Back in 1976, this species was common in springs and small streams, pools and qanats around the Hypersaline Lake and was found in at least 15 sites. While the situation was more or less stable in the period of 1976 - 2000, the species fast disappeared from all but one site in the 21<sup>st</sup> century. Water bodies just dried out due to the massive water extraction and the shortage of rainfall in the area. By 2013, only one spring remained in the area, but this spring is intensively used as a fish farm. *Aphanius farsicus* might still exist at this one site, but was not found during recent field work and might also already have vanished.

Two captive populations of *A. farsicus* exist in Europe and a third one in Iran. While it is no major problem to produce this species in numbers, the possibilities to reintroduce it into nature are still unexplored. As all, but one, of the natural habitats have dried



Spring Pirbanoo, which later dried out

out, alternative habitats need to be found in the area avoiding a situation of the Jordanian killifish *Aphanius sirhani*, which now only exist in artificial habitats, within its dried out former range (see 'What to do if there is no more water' pp. 26).

## Conservation action for the Aci Göl toothcarp, *Aphanius transgrediens*

Baran Yoğurtçoğlu and Güler Ekmekci

Hydrobiology Section, Biology Department, Faculty of Science, Hacettepe University, Turkey

---

There is a diverse and rich fauna of killifishes in Anatolia, Turkey and several species suffer a high risk of extinction in the near future. After listing the Aci Göl toothcarp as one of the most threatened species of the world by Baillie and Butcher (2012), some conservation action has started and there is now great hope that the species will be saved in the future. This is a great example of how species at the edge of extinction can be saved with relatively little efforts, but great awareness.

*Aphanius transgrediens* is endemic to a spring system of Lake Acıgöl. Lake Acıgöl possesses Turkey's largest sodium sulphate reserves that are extensively used in industry. In addition to

industrial activities, a dense population of alien *Gambusia holbrooki* is a serious threat to *A. transgrediens*. *Gambusia* preys on fry of *Aphanius* and much outnumbers the native killifish in most places. The Acıgöl spring system consists of about 30 small- sized freshwater springs flowing into the lake and the whole spring system has been invaded by *Gambusia*.

Within this framework, we have been carrying out a conservation project including *in-situ* and *ex-situ* breeding programmes and environmental education to the local community. The project has been financially supported by the Rufford Small Grants Organization for 12 months. After six months, the most important outcomes of the project have been completed.



**Gambusia free man-made pond [left] and fish sampling [right]**

Conservation actions include an initial assessment of the complete spring field. For this purpose; a) some physical-chemical properties of water have been measured on a monthly basis; b) classification of the springs according to their origins was carried out by isotope analysis; and c) dominant vegetation and plankton communities were determined. In parallel with these studies, fish samplings and fish counts were carried out to determine absence or presence of the species, abundance of individuals, and relative abundance of individuals of *Aphanius* and *Gambusia* in each spring, etc.

Since we had planned to establish viable stocks of *Aphanius transgredins* in its native habitat, we decided to conduct a pilot study by transporting a certain number of *Aphanius* to a *Gambusia*-free man-made pond at the south side of the lake, which was created during the project.

As public awareness is the key for the long-term success of the

project, we aim to make all the regional people and communities “proud of their endemic treasure”. Our first environmental education attempt was organized for elementary schools of Başmakçı, which is the closest village to our study area. We made a presentation about who we are, what we are doing, why the biodiversity and species conservation are important and what kind of fish species we want to protect or remove (i.e. invasive species).

To accomplish a long-lasting conservation in the future, more detailed assessments, including conservations genetics and experimental approaches and building more *Gambusia*-free ponds are urgently needed. For these actions, we are currently searching for additional funds.

#### Reference

Baillie, J.E.M. and Butcher, E.R. 2012. *Priceless or Worthless? The world’s most threatened species*. Zoological Society of London, United Kingdom.



**Project t-shirt [left] and local students wearing the project t-shirt [right]**

# Southern African tigerfish population learns to actively predate on swallows on the wing

Gordon O'Brien<sup>1</sup>, Francois Jacobs<sup>1</sup>, Steven Evans<sup>2</sup> and Nico Smit<sup>2</sup>

<sup>1</sup>Institute of Natural Resources and School of Life Sciences, University of KwaZulu-Natal, South Africa; <sup>2</sup>Water Research Group, Unit of Environmental Sciences and Management, North West North University, South Africa.



*Hydrocynus vittatus*  
Photo: Gordon O'Brien

Beneath the tranquil waters of an innocent looking lake in the heart of southern Africa, where migrating swallows stop to feed and drink on route to summer feeding habitats, an unusual ferocious predator awaits their arrival. Very few accounts of freshwater fish predated actively on birds exist, and no confirmed accounts of fish actively predated on birds while in flight have been documented, until now.

In the Schroda man-made Lake in the Mapungupwe National Park in South Africa (22°11'32.54"S and 29°25'59.93"E), the local tigerfish (*Hydrocynus vittatus*) population, established in 2003, has adapted a unique ability to actively prey on low flying barn swallows (*Hirundo rustica*) by leaping out of the water (Fouché *et al.*, 2008; O'Brien *et al.*, in press). This natural phenomenon showcases the ability of animals to identify unusual sources of food and learn to utilise these resources. The migration of the barn swallow population coincides with the spawning period of the local tigerfish population and this might be advantageous to the tigerfish, but the extent of their dependence on the migrating swallow population is unknown (O'Brien *et al.*, in press).

This ecologically important population of tigerfish still occurs in an ecosystem that may have been considered to be unsuitable without this unique adaptation (O'Brien *et al.*, in press).

This discovery was made in 2011 by scientists who were monitoring the behavioural ecology of the tigerfish population in Schroda Lake as a part of a greater scientific study (O'Brien *et al.*, 2012). During a summer survey to Schroda Lake in 2011, some tigerfish that were tagged and tracked displayed uncharacteristic increases in activity in a deep, open water area of the lake. This open water area was not associated with any previously established feeding or refuge areas of the tigerfish population in the lake. This uncharacteristic behaviour alerted the scientists to other tigerfish in the area that were leaping out of the water.

Fish swirl, porpoise and leap out of water for all sorts of reasons so, apart from the time of day and location, this was not considered to be usual. Francois then realised that the fish were attacking swallows that were feeding and/or drinking while in flight just above the surface of the lake. The swallows seemed to be forced



to congregate in one part of the lake, possibly due to the steep banks that surrounded the lake. Numerous successful and unsuccessful aerial attacks were observed by tigerfish. Some of these attacks were documented using motion picture video camera (Fouché *et al.*, 2008). Two predation strategies were displayed by the tigerfish population that preyed on as many fifteen individual swallows per day. These strategies included surface or near-surface pursuits that were visible, followed by aerial strikes, and direct aerial strikes initiated from deep water that were not visible. The surface pursuit strategies were less successful than direct aerial strikes initiated from deeper areas.

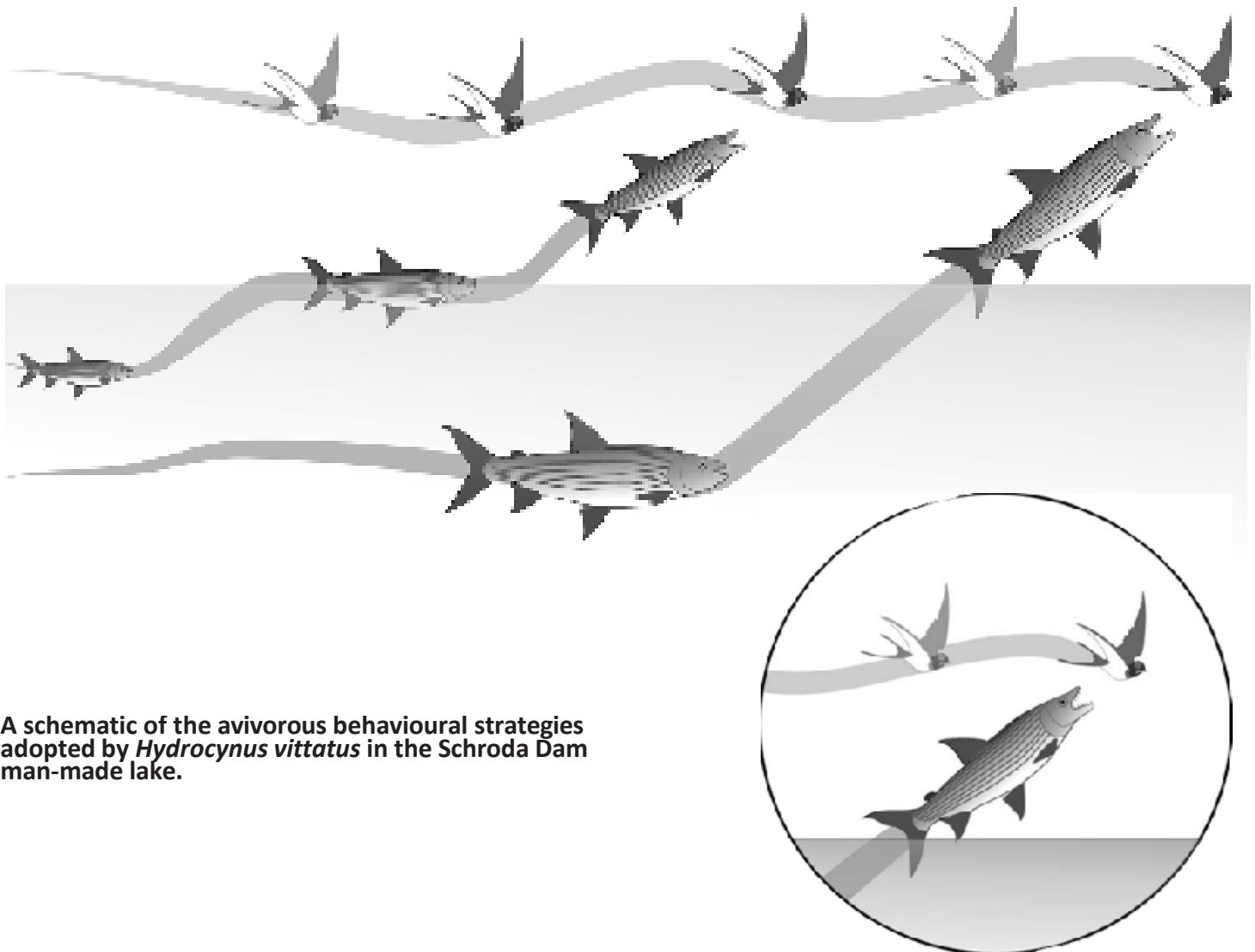
This discovery suggests that even the tranquil surfaces of lakes in Africa that provide migrating swallows with water during migrations are unsafe, and that the tigerfish population in Schroda Lake may still exist only because of the presence of a food source in the ecosystem which has, until recently, never been documented.

#### References

Fouché, P.S.O., Angliss, M.K. and Gagliano, C. 2008. *A baseline assessment of the aquatic ecology and limnology of Schroda manmade lake (Limpopo Province) with specific reference to the tigerfish population (Hydrocynus vittatus)*. Report by Enviro-Solution Systems for Venetia Conservation Society, De Beers Venetia Mine.

O'Brien, G.C., Jacobs, F., Evans, S.W. and Smit, N.J. *In Press*. First observation of Africa tigerfish (*Hydrocynus vittatus*) preying on Barn Swallows (*Hirundo rustica*) in flight. *Journal of Fish Biology* 84, 263–266

O'Brien, G.C., Bulfin, J.B., Husted, A. and Smit N.J. 2012. A Comparative behavioural assessment of an established and new Tigerfish (*Hydrocynus vittatus*) population in two artificial impoundments in the Limpopo catchment, southern Africa. *African Journal of Aquatic Sciences* 37(3), 1-8.



**A schematic of the avivorous behavioural strategies adopted by *Hydrocynus vittatus* in the Schroda Dam man-made lake.**

## Tackling giants: getting the most out of working groups for freshwater fish conservation

Harmony C. Patricio<sup>1</sup> and Steph Januchowski-Hartley<sup>2</sup>

<sup>1</sup>Society for Conservation Biology – Freshwater Working Group, and FISHBIO; <sup>2</sup>Society for Conservation Biology – Freshwater Working Group, and Center for Limnology, University of Wisconsin-Madison

Quick! Off the top of your head: List the number of “working groups”, “boards” “committees”, “consortiums”, “coalitions”, or “networks” you have been involved with in the past five years. Are you quickly moving past one handful of fingers? Now think about what proportion of these groups are truly successful in achieving their stated goals. How many groups are at least active to a degree? Is the proportion fairly low?

With all these different entities, our limited time, and our desire to affect change, how then can we be the most productive? Many of us recognize the importance of uniting people from different regions or disciplines or sectors to address a common goal. Yet, we repeatedly see progress stalling, a few active members taking on too much burden, and eventually some groups languish to nothing more than a name. Why does this happen so frequently in the conservation realm? Could it be because our passion leads us to say “yes” to requests to participate in groups when we realistically may not have the time to contribute much?

How then can we be most productive given our limited time? Asking this question isn’t easy, but it is essential if we want to achieve the goal of “Saving Freshwater Fishes and Habitats”.

We propose that freshwater fish specialists representing various groups and committees can be much more effective by communicating amongst groups with the goal of identifying three priority issues for any given year. Each group may have different tools to offer that will enable measurable progress on these priority issues. Each group can bite off a piece of the problem that they are best positioned to tackle. Many groups do communicate and collaborate, but to our knowledge there is no central clearing-house where information on activities and priorities of various groups is easily accessible.

We propose development of an umbrella forum to increase our productivity, enable information sharing, and reach the goal of establishing three priority issues through collective decision.

Many of us use RSS feeds to receive consolidated updates. Reddit has become one of the most popular websites for information exchange, with entries organized into over 5,400 topical categories. Each category or group is termed a “subreddit”. Registered members of a subreddit are enabled to rank the posts according to their relative importance. The basic functionality of the umbrella forum we propose would be similar to an RSS feed or a subreddit. Everyone subscribed would either receive updates or have access to a URL where they can easily view, rank, or contribute to the list of posts. Given the technology exists, why not use it to enhance communication amongst freshwater groups and to prioritize shared priorities? Considering the myriad entities operating in the freshwater realm, it is essential for complementary groups to engage one another to identify opportunities to align efforts both for collaboration and to take positions on critical issues.

The emerging application of Social Network Analysis to conservation also offers a set of tools that can increase the effectiveness of collaborations. For example, Mills *et al.* (2014) state, “Investing in areas that are highly connected both ecologically and through social networks could lead to potentially more efficient deployment of resources through more effective implementation.” While it might not always be feasible to use formal assessments to identify the most proficient methods for collaboration; thinking along these lines can enable identification of tools that guide us towards more productive decision-making and resource allocation.

How else can we build collaborations that are productive in achieving conservation outcomes? Over the past few years we, the authors, have been engaged in the Society for Conservation Biology (SCB) and its Freshwater Working Group. The SCB is very productive in many respects, and several key policies influencing conservation have come from its members. Unfortunately, we have seen an obvious lack of involvement from freshwater scientists in the Society, and a decline in the number of papers focused on

fresh waters published in the journal *Conservation Biology*. We have started asking ourselves, where are the freshwater scientists in the SCB? Do many people working on freshwater consider their efforts to be outside the realm of conservation biology?

We believe the Society for Conservation Biology is a platform that has not been effectively exploited by freshwater scientists. The Society provides channels for pursuing funding to support core efforts, and access to decision makers at a high level. Perhaps many freshwater fish specialists do not think of themselves as conservation biologists, while alternatively many conservation biologists may not be aware of the vital role their work can play in conservation of freshwater biodiversity. In actuality, most organisms of interest to conservation biologists, even the terrestrial, depend on healthy aquatic ecosystems nearly as much as the fish living in the water itself.

If we wish to contribute productively to saving freshwater fishes and habitats, we must step outside of the comfort zone. It's a little pond for freshwater scientists, so let's make ripples. It will be the combined force of us each holding down one rope on a singular critical issue that will enable us to conquer giant challenges. Reach out. Focus your energy. Keep looking for key outcomes

being pursued by other groups with which you can easily align the activities of a group you are already part of. Engage players from sectors that have an economic interest in fresh water resources. Take steps to identify where you can be most effective so you don't get burned out. Share your knowledge with those in other fields who are doing something big for conservation, and show them how important freshwater biodiversity is. We may not have furry and cuddly critters, but our work targets the most highly threatened species and systems on the planet. It's time for freshwater specialists to have a greater role in the global conservation agenda.

#### **Reference**

Mills, M., Álvarez-Romero, J.G., Vance-Borland, K., Cohen, P., Pressey, R.L, Guerrero, A. M. and Ernstson, H. 2014. Linking regional planning and local action: Towards using social network analysis in systematic conservation planning. *Biological Conservation* 169: 6-13.

#### **Resource**

Society for Conservation Biology – Freshwater Working Group: <http://www.conbio.org/groups/working-groups/freshwater>

# NOTICEBOARD



## **CONNECTING FISH, RIVERS AND PEOPLE**

We want to invite you to take part in World Fish Migration Day 2014 on the **24th May**. This international event calls attention to the need to safeguard free flowing rivers and to restore the connections in rivers for migratory fish.

### **WHY DO WE CARE?**

Migratory fish (like salmon, trout, shad, lamprey, giant catfish, sturgeon and eel) are threatened worldwide by barriers such as weirs, dams and sluices built for water management, hydropower and land drainage. This makes it difficult for fish to reach their spawning grounds, and can conceivably cause species extinction. Millions of people around the world rely on these fishes as their primary source of protein and for their livelihoods. Water managers and conservationists are striving to protect and improve fish migration routes between and within rivers, deltas and the oceans. These 'fish highways' are vital for their survival.

World Fish Migration Day is held to improve the public's understanding of the importance of free flowing rivers and migratory fish routes for fish. Raising awareness, sharing ideas, securing commitments and building communities around river basins are essential aspects of fish passage and river restoration. On this day, we will connect celebrations and events that start in New Zealand, and follow the sun; ending as the sun sets on the west coast of North America.

More than 250 locations will be connected worldwide. We are looking for organizations that want to join this inspiring initiative. There is already an exciting array of events planned, varying from a fish way tour in the Kruger National Park (South Africa) to walks along the River Kuma (Japan) to observe the dam removal project to talks, seminars and kids' activities planned in many countries around the world.

### **WOULD YOU LIKE TO ORGANIZE AN EVENT?**

Participating organizations will organize their own event (e.g. activity sessions, workshops or talks) and outreach communication, under the umbrella of the World Fish Migration Day. Educational material will be available to share with visitors. Wanningen Water Consult & LINKit consult, partnering with WWF (NL), The Nature Conservancy (USA) and the IUCN SSC/Wetlands International Freshwater Fish Specialist Group, will take care of the central coordination, international publicity and maintain the main website. The projects will be highlighted on the website, social media and in the press. On the day itself, the offices of water authority 'Amstel, Gooi and Vecht' (Amsterdam, The Netherlands) will serve as the headquarters of WFMD

### **For more information**

Web: [www.worldfishmigrationday.com](http://www.worldfishmigrationday.com)

Facebook: [www.facebook.com/WorldFishMigrationDay](http://www.facebook.com/WorldFishMigrationDay)

Twitter: [twitter.com/WFMD2014](http://twitter.com/WFMD2014)

Instagram: [instagram.com/fishmigrationday](http://instagram.com/fishmigrationday)

### **To organize an event, please contact us:**

Email: [herman@wanningenwaterconsult.nl](mailto:herman@wanningenwaterconsult.nl)

Phone: 0031-6-182 725 72



INSTITUTE OF  
FISHERIES MANAGEMENT



## **IFM Lamprey Conference 2014**

**International conference on the biology, conservation and management of lamprey.**

**National Science Learning Centre, York, England  
6th – 7th May 2014**

The conference will be held in the historic city of York and aims to provide a forum for discussion and networking for people engaged in work on these enigmatic species. There will be optional field trips on May 8th for those who are able to stay longer.

We are pleased to announce that Professor Margaret Docker from the University of Manitoba and Dr Pedro Almeida from the University of Evora in Portugal will be presenting the keynote addresses.

There has been interest from across the globe with papers submitted from 14 different countries to date with numerous different species highlighted. We aim to bring as many people as possible together to share their knowledge and research on lampreys, with the hope that we can raise the profile of this often forgotten group of fishes.

If you are interested in any of the 35 species of lamprey at sea, in rivers or in lakes, then this is the conference for you.



Registration is now open on the [IFM website](#)



# Global Inland Fisheries Conference



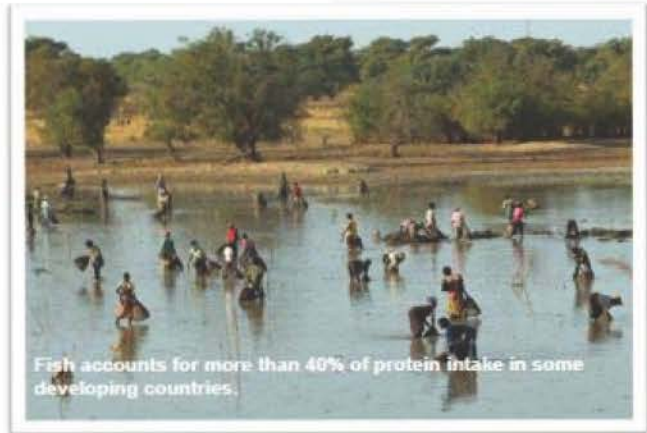
## Freshwater, Fish, and the Future 26-30 January 2015, Rome

Freshwater fisheries around the world are facing serious challenges. Inland fisheries are a critical food resource, especially in much of the developing world, yet agricultural, water management, and investment policies are often at odds with maintaining the long term sustainability of inland fisheries. A lack of reliable data has hampered international monitoring and conservation programs management is largely confined to the local level rather than regionally strategic efforts.

In January 2015, a ground-breaking conference in Rome will for the first time address the challenges and opportunities for freshwater fisheries at cross-sectoral levels on a global scale. Never before have scientists, policy makers, and the international development community gathered together to discuss the food security, economic, and ecological issues associated with inland fisheries around the world. This global conference is a multi-sectorial call to raise the profile of inland fisheries and better incorporate them in agricultural land use and water resource planning through development of improved assessment frameworks and value estimation.

The conference will include freshwater commercial, subsistence, aquaculture, and recreational fisheries, as well as the complex ecosystem services provided by inland aquatic systems. The Global Inland Fisheries Conference is sponsored by Michigan State University and the Food and Agriculture Organisation of the United Nations (FAO); the conference will be held at the FAO headquarters in Rome.

The conference will communicate the value of inland fisheries to policy makers and the public; review assessment and valuation strategies; recommend policy commitments; provide policy makers with the means to better integrate inland fisheries into development planning processes; identify critical pathways in water resource allocation, climate change adaptation, food security and nutrition, and biodiversity conservation; develop recommendations for measurable global targets; and synthesize the conference contributions and deliberations into a guidance document on the future of inland fisheries.



Fish accounts for more than 40% of protein intake in some developing countries.

### Concerns to Be Addressed by the Global Inland Fisheries Conference:

**Inland fish and fisheries, and their habitats, need to be included in policy discussions and decisions, as well as investment strategies.**

Many development and management decisions on the use of freshwaters are made without accurate consideration of their impact on inland fisheries and fisheries-dependent communities.

**We need regular and accurate reporting to inform discussions.**

Globally, 156 of 230+ countries and territories reported to FAO in 2010 – many countries known to have substantial inland fisheries do not report any information to FAO and more than 50% of all reported inland catch is not identified to species.

**To communicate the importance of allocating freshwater resources to fish, as well as to other water-dependent sectors, we need to better understand and communicate the value of inland fisheries to the economy and health of society.**



# Global Inland Fisheries Conference

## Conference Themes

**Biological Assessment:** Explore and develop new approaches to assess the production and status of inland fish stocks and the fisheries.

**Economic and Social Assessment:** Explore and develop new approaches to provide monetary and nonmonetary value to fisheries, and their importance to human health, personal well-being, and societal prosperity. Showcase proven methods of investment, across various sectors, which can provide a framework to sustain inland fisheries and other freshwater resource use.

**Drivers and Synergies:** Identify synergies between the services that can be made to increase societal gain while maintaining ecological integrity and allowing for the protection of aquatic biodiversity and fisheries production.

**Policy and Governance:** Develop methods to assure that governance decisions take into account the contribution inland fisheries make to food security, human well-being and ecosystem productivity.



Recreational and small-scale commercial fishing is an important factor in rural economies.

**Future of fisheries:** Each of the above themes will contribute towards synthesis on the Future of Inland Fisheries to inform long-term strategic planning for sustainable inland fisheries and affiliated communities at local, regional and global levels.

### Call for Papers

The First Call for Papers will be issued in early 2014, with submissions accepted until 10 August 2014. Please check the conference website [www.inlandfisheries.org](http://www.inlandfisheries.org) for more details. Travel support for a limited number of participants from developing countries and students will be available.

Follow the conference on Twitter: @inlMdfisheries and Facebook: [www.facebook.com/inlandfisheries](http://www.facebook.com/inlandfisheries), and join our discussion group on LinkedIn: [www.linkedin.com/groups/Global-inland-fisheries-Conference-7402542/about](http://www.linkedin.com/groups/Global-inland-fisheries-Conference-7402542/about)



Freshwater, Fish, and the Future

A global cross-sectorial conference to sustain livelihoods, food security, and aquatic ecosystems  
26-30 January 2015, Rome

**Contact:** Bill Taylor, Michigan State University  
[taylor@anr.msu.edu](mailto:taylor@anr.msu.edu)

Devin Bartley, FAO  
[Devin.Bartley@fao.org](mailto:Devin.Bartley@fao.org)

[www.inlandfisheries.org](http://www.inlandfisheries.org)

## NEXT ISSUE OF 'SAVING FRESHWATER FISHES AND HABITATS'

Do you want to share news from your freshwater fish conservation project with a global audience? Are you doing fascinating research or organising an exciting event? Well, the FFSG Newsletter could be the perfect way to tell your story!

The deadline for submitting material for the next issue is 9th May 2014.

If you have any questions or if you want to submit material, please email [info@iucnffsg.org](mailto:info@iucnffsg.org)



The Freshwater Fish Specialist Group is generously supported by Chester Zoo, UK.

[www.chesterzoo.org](http://www.chesterzoo.org)